

# BE WELL

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*Balanced Eating - Workout Effectively - Live Long*



## ***Strength Training Module***

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# ***What is Muscular Strength?***

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- The ability of the neuromuscular system to produce internal tension and exert resistance against an external force
- The force that a muscle can produce





# ***Strength vs. Endurance***

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- Muscular Strength
  - Maximum force a muscle produces against a resistance in a single, maximal effort
  - Example: 1 Repetition Max (RM)
- Muscular Endurance
  - Capacity of a muscle to exert force repeatedly against a resistance or to hold a static contraction over time
  - Repeated sets and repetitions



# ***Benefits of Strength Training***

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- Prevents injury
- Improves balance
- Improves joint stabilization
- Improves body composition
- Increases bone density
- Increases metabolic rate





# ***Types of Muscular Strength***

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- **Stabilization Strength (Balance)**
  - Ability of certain muscles to stabilize joints during functional movements
- **Starting Strength (Coordination)**
  - Ability to produce high levels of force at the beginning of a movement
- **Explosive / Speed Strength (Power)**
  - Ability to develop a sharp rise in force production once a movement pattern has been initiated



# ***Types of Muscular Strength***

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- Reactive Strength (Agility)
  - Ability of the neuromuscular system to switch quickly and efficiently between types of contractions
- Endurance Strength (Endurance)
  - Ability to produce and maintain force over prolonged periods of time



# ***Muscle Training Order***





# ***Muscle Training Principles***

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- Overload
  - Improvements occur when demands are consistently increased to levels above what the muscle is accustomed to
- Specificity
  - Gains made in fitness are specific to the type of training and the muscle groups involved







# ***Muscle Training Principles***

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- **Cross-over of Training**
  - Some benefits occur while performing non-specific exercise
    - Bench press will assist in performing push-ups
    - Strength training assists in better running performance
- **Progression**
  - Progressively change program design as fitness levels increase to meet new demands in a slow, step-by-step fashion
    - Must scale the initial load and intensity equal to the individual's current level of fitness



# ***Muscle Training Principles***

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- **Regularity / Reversibility**
  - Fitness improvements and maintenance can only occur when exercise is performed on a regular basis
  - Detraining occurs rapidly and is based on age, current fitness levels, and the amount of exercise reduction
- **Variation**
  - Enables continuous adaptations to occur over a training period and prevent injury
    - Example: Interval training can be incorporated for beginners to world class athletes



# ***Muscle Training Principles***

- **Balance**

- Ensure opposing muscle groups are worked equally
- Muscle imbalances affect performance and can lead to injuries
- Focusing on single modes of exercise ignore muscles and energy systems that should be exercised
  - Runners need upper body and core strength for optimal performance
  - Weight lifters need aerobic workouts for optimal health benefits





# ***Resistance Progression***

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1. Focus on isolating muscle & movement pattern
2. Introduce more challenging functional positions with multi-muscle movements
3. Add balance, functional challenge, speed, or rotation





# Core Training

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- Core strength: the balanced development of the trunk, especially the abdominal and back muscles
- Weak core causes inefficient movement and can lead to injury
- Benefits:
  - Improves posture during movement
  - Ensures appropriate muscular balance
  - Ensures optimal joint motion around the hips
  - Allows dynamic function and improves coordination
  - Prevents and / or improves low back pain



# ***Functional Strength***

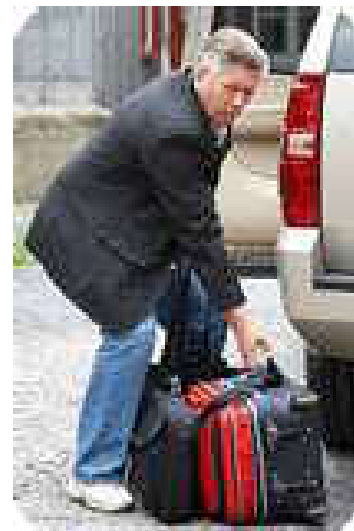
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# ***Functional Training***

- Exercises that train the body for activities of daily living
- Primarily weight bearing while engaging core muscles

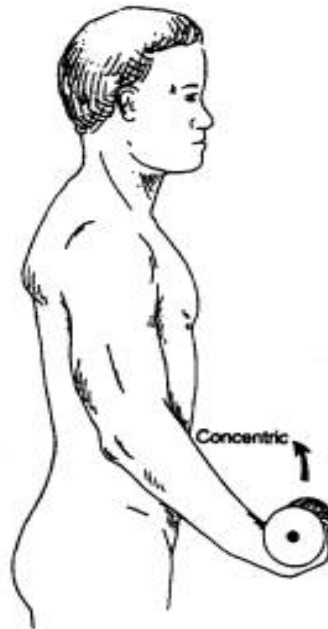




# ***Types of Muscle Contractions***



**Isometric  
Contraction**



**Concentric  
Contraction**



**Eccentric  
Contraction**





# ***Muscle Training Terminology***

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- Hypertrophy – increase the size of muscle cells
- Repetition “rep” – a single cycle of lifting a weight in a controlled manner
  - Rep Maximum (RM) – number of repetitions one can perform at a certain weight
- Set – several repetitions performed one after another with no break between the reps



# ***Muscle Training Terminology***

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- **Single Set**

- Perform 1 set of each exercise
- Perform 8-12 repetitions of each exercise at a slow, controlled tempo

- **Multiple Sets**

- Consists of 2 or 3 warm-up sets of increasing resistance, followed by 2 or more training sets at a challenging resistance
- Perform 8-12 repetitions of each exercise at a slow, controlled tempo



# ***Muscle Training Terminology***

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- **Superset** – two exercises with little to no rest of opposing muscle groups
- **Compound set** – two different exercises with little to no rest for the same muscle group





# ***Muscle Training Terminology***

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- **Pyramid**

- Increasing resistance and decreasing repetitions with each subsequent set; usually 4-6 sets



- **Periodization**

- Organized approach in manipulating sets, repetitions and intensity over time



# ***Muscle Training Terminology***

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- **Circuit Interval Training**

- A “total-body tune-up” – training in different ways to improve overall performance
- Mixing strength training and cardiovascular training together in each exercise session
- Scale intensity and volume based on fitness level throughout each exercise session





# ***Training Basics***

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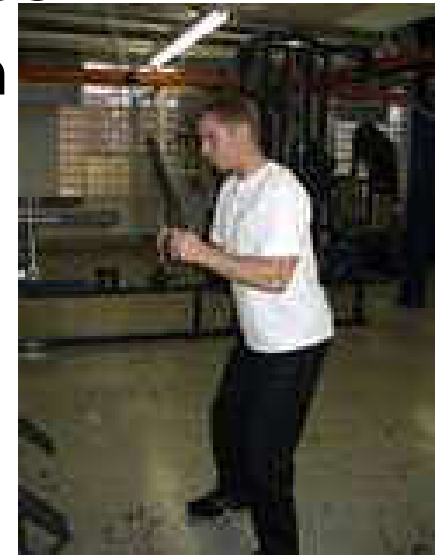
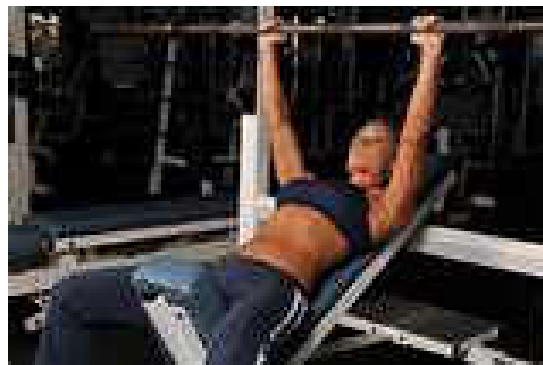
- Training frequency:
  - Minimum 2 days per week with increasing frequency to 5 days/week based on training goals and program design
  - Minimum 10-20 minutes per session
  - Do not strength train the same muscle group on consecutive days, allow 48 hours rest period





# *Training Basics*

- Order of exercises:
  - 1) Complete multi-joint exercises first
    - Examples: bench press, squat
  - 2) Then complete single-joint exercises
    - Examples: bicep curl, triceps extension





# Training Basics

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- Volume – usually 3 sets of 10 repetitions at about 70% of one-repetition maximum
  - Volume = sets x reps x load
- Frequency – usually 2-3 days per week for beginners doing full body resistance training





# ***Training Basics***

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- Sets and repetitions based on goals:
  - For strength: 2-3 sets of 5-8 reps
  - For hypertrophy: 2-3 sets of 8-12 reps
  - For endurance: 2-3 sets of 12-15 reps





# ***Periodization and Rest***

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- Periodize: light, medium, heavy workouts
- Rest your body 48 hours between full-body resistance workouts
- Rest approximately 1 minute between sets
- When increasing the intensity of exercises, increase the length of rest periods



# Equipment Needed

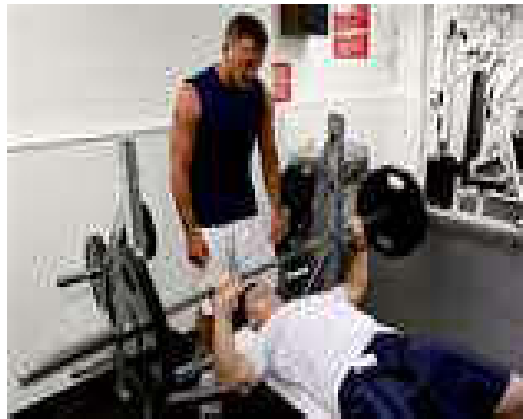
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- Any equipment that uses resistance to force the muscle to contract
- Muscles overload when they resist being pushed, squeezed, stretched, or bent
- Gradually and progressively overload the muscle so it gets stronger
- Body weight alone can provide resistance



## ***Equipment Needed***

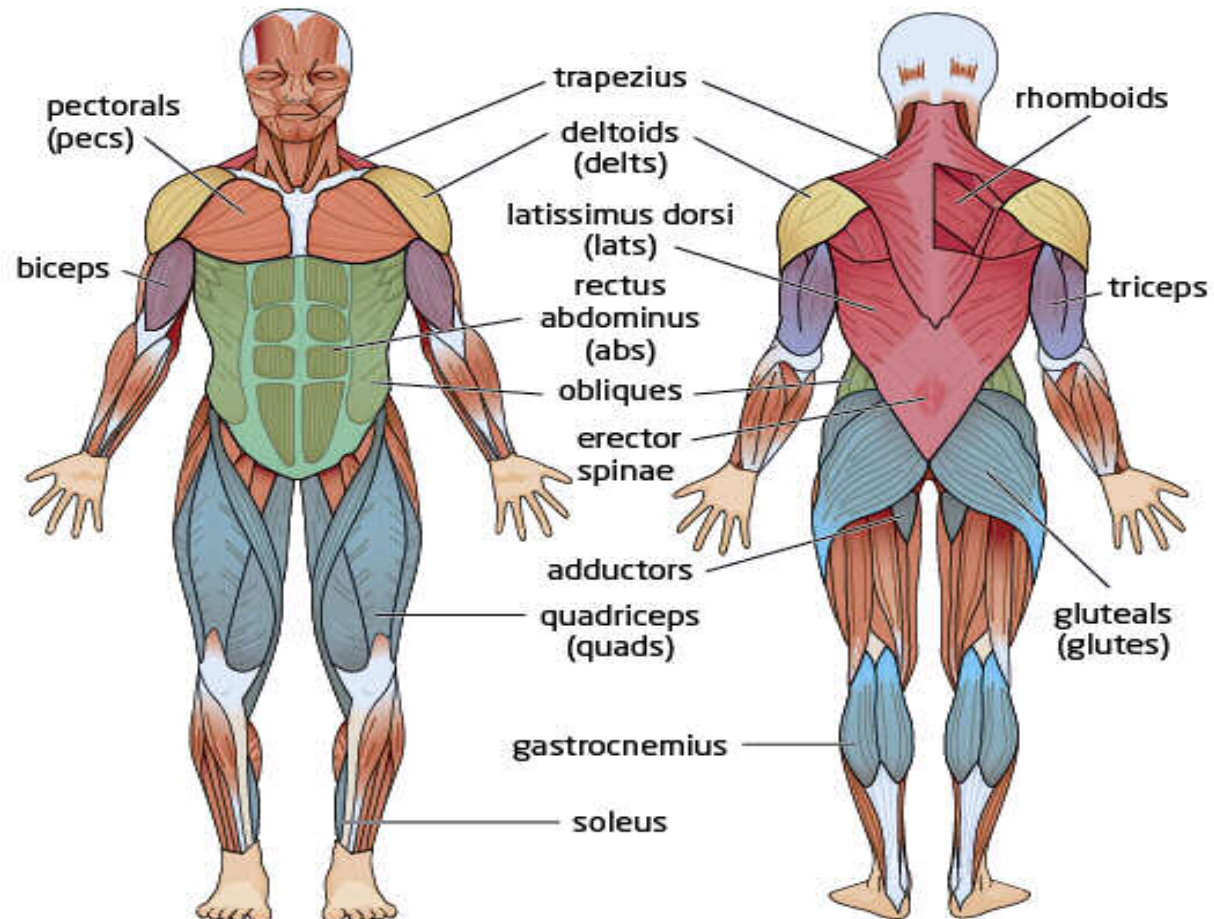
- Free weights
- Nautilus-type machines
- Resistance bands and tubing
- Medicine balls
- Body weight





# Major Muscle Groups

Core  
Chest  
Back  
Legs  
Arms





# Sample Exercises

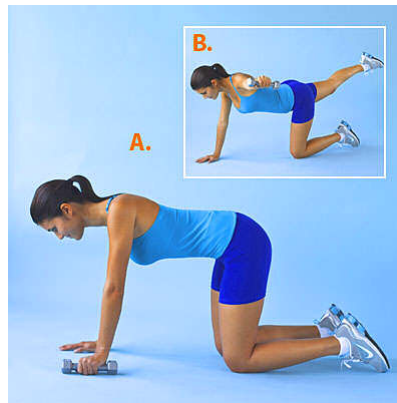
- Exercises for major muscle groups:
  - Core exercises
  - Chest exercises
  - Back exercises
- Leg exercises (quadriceps, hamstrings)
- Arm exercises (biceps, triceps, shoulders)





# Core Exercise Examples

- Ball Crunches
- Quadrupeds
- Reverse Crunch
- Planks





# *Chest Exercise Examples*







# ***Back Exercise Examples***

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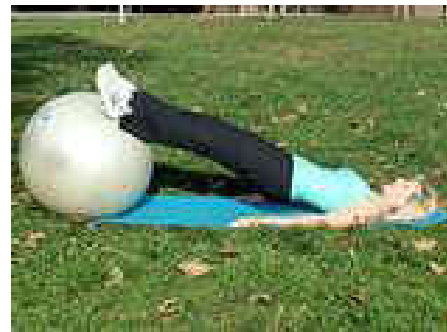
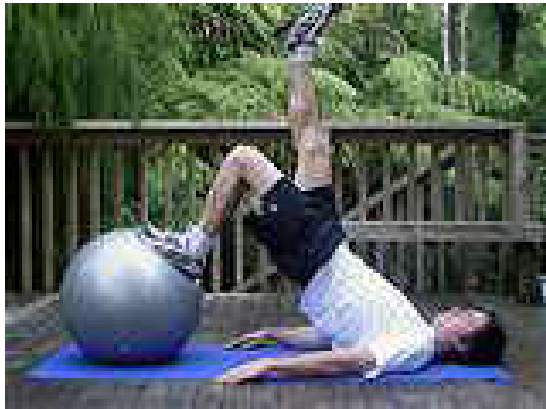


# Leg Exercise (Quadriceps) Examples





# Leg Exercise (Hamstrings) Examples





# *Arm Exercise (Biceps) Examples*

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# *Arm Exercise (Triceps) Examples*

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# *Arm Exercise (Shoulders) Examples*







# ***Push-ups***

**Strengthens chest, triceps, neck, core muscles**



Correct up position

Correct down position





# Sit-ups

Strengthens abdominal and hip flexor muscles







## ***Getting Started***

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- **Warm up** before you start lifting weights.
- **Lift and lower your weights slowly**
- **Breathe.** Don't hold your breath
  - Make sure you're using full range of motion throughout the movement
- **Maintain good posture and proper technique**



# ***Develop Your Training Program***

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- Identify your needs
- Set your strength and endurance goals
- Develop your plan

